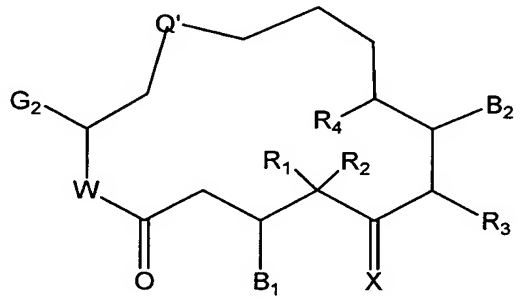
Claims

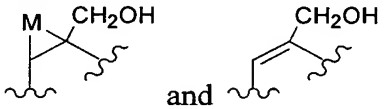
What is claimed is:

1. A method for the preparation of at least one 26-hydroxyepothilone of formula:



where:

Q' is selected from the group consisting of



G_2 is the following formula (VI)

$$CH_3\text{-}(A_1)_n\text{-}(Q_a)_m\text{-}(A_2)_o\text{-} \qquad \text{(VI)}$$

A_1 and A_2 are independently selected from the group of optionally-substituted $(C_1\text{-}C_3)$alkylene and $(C_2\text{-}C_3)$alkenylene;

Q_a is an optionally-substituted ring system containing one to three rings and at least one carbon to carbon double bond in at least one ring;

n, m, and o are integers independently selected from the group consisting of zero and 1, where at least one of m or n or o is 1;

W is O or NR_6;

X is selected from the group consisting of O, and H, OR_7;

M is O, S, NR_8, or CR_9R_{10};

B_1 and B_2 are selected from the group consisting of $-OR_{11}$ and $-OC(=O)R_{12}$;

R_1-R_4 and R_{12}-R_{17} are selected from the group consisting of H, alkyl, substituted alkyl, aryl, and heterocyclo, except R_{15} is not hydrogen, and when R_1 and R_2 are alkyl, they can be joined to form a cycloalkyl;

R_6 is selected from the group consisting of H, alkyl, and substituted alkyl;

R_7 and R_{11} are selected from the group consisting of H, alkyl, substituted alkyl, trialkylsilyl, alkyldiarylsilyl, and dialkylarylsilyl;

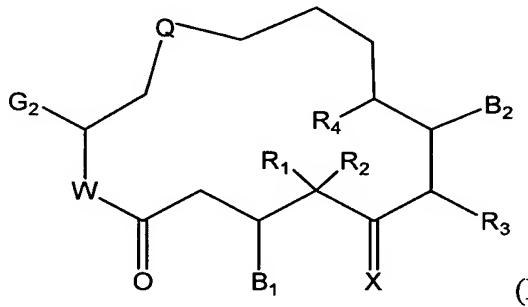
R_8 is selected from the group consisting of H, alkyl, substituted alkyl, $R_{13}C(=O)$-, $R_{14}OC(=O)$-, and $R_{15}S(O)_2$-; and

R_9 and R_{10} are selected from the group consisting of H, halogen, alkyl, substituted alkyl, aryl, heterocyclo, hydroxy, $R_{16}C(=O)$-, and $R_{17}OC(=O)$-;

the pharmaceutically-acceptable salts thereof and any hydrates, solvates, or geometric, optical and stereoisomers thereof;

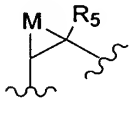
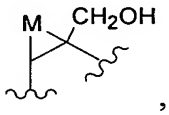
comprising the steps of:

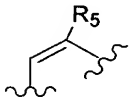
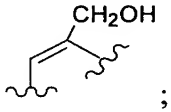
a) contacting at least one epothilone of formula IVa



(IVa)

where:

Q is  when Q' is  , and

Q is  when Q' is  ;

R_5 is $-CH_3$; and

W, X, G_2, M, B_1, B_2, R_1-R_4, and R_6-R_{17} are defined above;

the pharmaceutically-acceptable salts thereof and any hydrates, solvates, or geometric, optical and stereoisomers thereof;

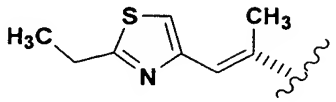
with a microorganism or enzyme derived therefrom capable of selectively catalyzing the hydroxylation of said R_5 group to $-CH_2OH$; and

b) effecting said hydroxylation.

2. The method of claim 1 wherein n is zero and m is 1.

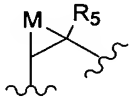
3. The method of claim 1 wherein n is zero, m is 1, and A_2 is alkenyl.

4. The method of claim 1 wherein G_2 is

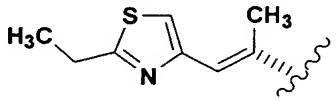


5. The method of claim 1 wherein said microorganism is *Amycolata autotrophica* ATCC 35203.

6. The method of claim 1 wherein Q is



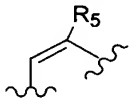
7. The method of claim 6 wherein G_2 is



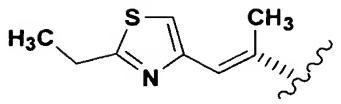
8. The method of claim 7 wherein said epothilone of formula IVa is epothilone B and said 26-hydroxyepothilone is 26-hydroxyepothilone B.

9. The method of claim 8 wherein said microorganism is *Amycolata autotrophica* ATCC 35203.

10. The method of claim 9 wherein said Q is



11. The method of claim 10 wherein G_2 is



12. The method of claim 11 wherein said epothilone of formula IVa is epothilone D and said 26-hydroxyepothilone is 26-hydroxyepothilone D.

13. The method of claim 12 wherein said microorganism is *Amycolata autotrophica* ATCC 35203.

14. A method for the preparation of a mixture of epothilone F and 26-hydroxyepothilone B
comprising the steps of:
a) contacting epothilone B with a microorganism or enzyme derived therefrom capable of catalyzing the hydroxylation of said epothilone B to epothilone F and 26-hydroxyepothilone B; and
b) effecting said hydroxylation.

15. The method of claim 14 wherein said microorganism is *Amycolata autotrophica* ATCC 35203.

16. An isolated microorganism, or a mutant or variant thereof, having ATCC accession number PTA-1043.

17. A biologically pure culture of a microorganism, or a mutant or variant thereof, having ATCC accession number PTA-1043.